

# M16A1 AND M16A2 RIFLE MARKSMANSHIP

## FM 23-9

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Q. What Army publication covers the M16A1/A2 rifles and the fundamentals of rifle marksmanship?

A. FM 23-9

Q. Describe the M16A1 Rifle.

A. It is a 5.56-mm, magazine-fed, gas-operated, shoulder-fired weapon capable of firing in either the semiautomatic or automatic modes through the use of a selector lever (SAFE, SEMI, and AUTO).

Q. Describe the M16A2 Rifle.

A. It is a 5.56-mm, magazine-fed, gas-operated, shoulder-fired weapon capable of firing in either the automatic three-round burst or semiautomatic single-shot modes (SAFE, SEMI, and BURST).

Q. Describe the proper procedure for CLEARING the M16 Rifle.

A.

- (1) Attempt to place the selector lever on SAFE. If the selector lever will not go on SAFE, pull the charging handle to the rear and place the selector lever on safe.
- (2) Remove the magazine, if there is one, from the magazine well.
- (3) Lock the bolt to the rear by pulling the charging handle to the rear while pressing the lower portion of the bolt catch; allow the bolt to move forward until it engages the bolt catch. Return the charging handle to the forward position.
- (4) Visually inspect the chamber and receiver areas for ammunition.
- (5) With the selector lever still on SAFE, allow the bolt to go forward by pressing the upper portion of the bolt catch.

NOTE: When on a range, clearing procedures will differ slightly. When the last round is fired the bolt will automatically lock in the rear position. Simply place the weapon on SAFE, drop the magazine from the magazine well, and wait to be "rodded" from the range (or wait for additional instructions).

Q. What are the firing weights of the M16A1 and M16A2 Rifle with 20- and 30-round magazines?

A.	<u>M16A1</u>	<u>M16A2</u>
• 20-round mag.....	7.6 lbs .....	8.5 lbs
• 30-round mag.....	7.9 lbs .....	8.8 lbs

Q. It follows then, from the above question, that the difference in firing weight between the M16A1 and M16A2 rifles is what?

A. Approximately 1 pound (15 oz).

Q. What bayonets are used with the two rifles?

A. M16A1 - M7 Bayonet; M16A2 - M9 Bayonet.

Q. What is the overall length of the M16A1 rifle with flash suppressor?

A. 39 inches

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Q. What is the overall length of the M16A2 rifle with compensator?

A. 39(5/8) inches

Q. Which has a longer barrel, the M16A1 or the M16A2?

A. The barrel lengths are the same (does not include suppressor/compensator).

Q. What types of ammunition are used in the M16 rifle?

A. Ball, tracer, blank, dummy, and plastic.

Q. What is the recommended basic load for the M16 rifle (30-round magazine)?

A. 210 rounds (one mag in weapon and six in ammo pouches).

Q. Describe the differences in the following operational characteristics of the two weapons.

A.	<u>M16A1</u>	<u>M16A2</u>
• rifling	RH, 1/12 twist	RH, 1/7 twist
• muzzle velocity	3,250 fps	3,100 fps
• cyclic rate of fire	700-800 rpm	same (theoretically)

NOTE: RH, 1/12 twist means that the rifling twists clockwise one complete revolution in 12 inches. It can be seen that M16A2 rifling is tighter, allowing greater stability of the heavier A2 rounds.

Q. Describe the differences in the maximum effective rates of fire of the two weapons.

A.	<u>M16A1</u>	<u>M16A2</u>
• semiautomatic	45-65 rpm	45 rpm
• automatic	150-200 rpm	90 rpm (3-rnd burst)
• sustained	12-15 rpm	same

Q. What are the maximum ranges of the two weapons?

- A.
- M16A1 - 2,653 meters
  - M16A2 - 3,600 meters

NOTE: Some references give maximum range of M16A2 as 3,534 meters. In this instance the maximum range has been rounded off. In all instances, the maximum range would depend on a variety of factors and is never absolute.

Q. What are the maximum effective ranges of the M16A1/A2 rifles?

- A.
- M16A1 - 460 meters
  - M16A2 - 550 meters (point target), 800 meters (area target)

Q. Name some of the basic differences between the two rifles.

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A.

- The M16A2 is 5/8" longer.
- The A1 has a flash suppressor - the A2 a compensator.
- The barrel on the A2 has a larger outside diameter.
- The A2 handguards are interchangeable.
- The A2 has a brass deflector molded into receiver.
- The sight systems are different.
- The A2 fires on 3-round burst.
- The A2 is more accurate at longer distances.
- The recommended ammunition is different.

Q. What is the purpose of the compensator on the M16A2?

A. Helps keep the muzzle down during firing.

Q. What was the major advantage of the M16A1 over the M16?

A. The addition of the forward assist.

Q. What are the eight steps in the cycle of functioning of the M16 rifle?

A.

- (1) Feeding
- (2) Chambering
- (3) Locking
- (4) Firing
- (5) Unlocking
- (6) Extracting
- (7) Ejecting
- (8) Cocking

Q. While operating the M16A2 in the BURST fire mode you inadvertently release the trigger, interrupting the three-round cycle and producing only two shots. What will happen when the trigger is pulled to the rear again?

A. Only one shot will be fired (this is not a malfunction, the weapon is merely completing the interrupted three-round cycle).

Q. What is meant by the "stoppage" of a weapon?

A. The failure to complete the cycle of functioning of a weapon.

Q. What is meant by "immediate action"?

A. The unhesitating application of a probable remedy to reduce a stoppage without investigating the cause.

Q. What is the proper procedure for applying immediate action?

A. Gently slap upward on the magazine to ensure that it is fully seated, and the magazine follower is not jammed. Pull the charging handle fully to the rear and check the chamber (observe for the ejection of a live or expended cartridge). Release the charging handle (do not ride it forward). Strike the forward assist assembly to ensure

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bolt closure. Try to fire the rifle.

Q. What word is commonly used to remember the procedure for applying immediate action?

A. SPORTS;

- (S)lap upward on the magazine;
- (P)ull the charging handle to the rear;
- (O)bserve the chamber;
- (R)elease the charging handle;
- (T)ap the forward assist;
- (S)hoot.

Q. How many times should immediate action be applied to a weapon?

A. Only once, if the rifle still fails to fire, inspect it to determine the cause of the stoppage or malfunction and take appropriate remedial action.

Q. What is meant by “remedial action”?

A. The continuing effort, through inspection, to return a weapon to operation.

Q. What is considered a “malfunction”?

A. A procedural or mechanical failure of the rifle, magazine, or ammunition.

Q. What are the three primary categories of malfunctions?

A.

- (1) Failure to feed, chamber, or lock.
- (2) Failure to fire cartridge.
- (3) Failure to extract and eject.

Q. Explain which weapon the following ammunition may be used in.

A.

- |               |          |                      |
|---------------|----------|----------------------|
| • M193 Ball   | A1 only  | no identifying marks |
| • M196 Tracer | A1 or A2 | red or orange tip    |
| • M199 Dummy  | A1 or A2 | grooved cartridge    |
| • M200 Blank  | A1 or A2 | violet tip           |
| • M855 Ball   | A2 only  | green tip            |
| • M856 Tracer | A2 only  | red tip              |
| • M862 PPA    | A1 or A2 | light blue plastic   |

Q. How is M862 Plastic Practice Ammunition (PPA, also known as Short-Range Training Ammunition (SRTA)), used with the M16 rifle?

A. With the special M2 bolt, which converts the rifle from gas-operated to blowback-operated. The SRTA can be used in an unmodified rifle; however, the rifle will only function in the single-shot mode.

Q. When firing M200 Blanks from the M16 rifle, what device must be used to ensure the proper functioning of the weapon?

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A. The M15A2 Blank Firing Attachment (BFA). It is designed to keep sufficient gas in the barrel of the weapon to allow semiautomatic, automatic, or burst firing.

Q. When it is necessary to store ammunition in the open, it must be raised on dunnage at least \_\_\_\_\_ inches from the ground and protected with a cover, leaving enough space for air circulation.

A. 6

Q. If destruction of the individual rifle must be performed to prevent enemy use, the rifle must be damaged so it cannot be restored to a usable condition. What are the four preferred means of destruction of M16 rifles?

A. Mechanical, burning, demolition, and disposal.

Q. Expedient destruction requires that key operational parts be separated from the rifle or damaged beyond repair. What is the destruction priority for the parts of the weapon?

A.

FIRST: bolt carrier group.

SECOND: upper receiver group.

THIRD: lower receiver group.

Q. What are the four basic fundamentals of rifle marksmanship?

A.

- Steady position
- Aiming
- Breath Control
- Trigger Squeeze

Q. What are the two basic firing positions?

A.

- Individual supported
- Prone unsupported

Q. Name five other firing positions (considered advanced firing positions)?

A.

- Kneeling unsupported
- Kneeling supported
- Standing unsupported
- Standing supported
- Lying flat on back (supine)

Q. What firing positions would best be used while defending against an air attack?

A. Standing supported (with bi-pod) and supine.

Q. What is the purpose of "battlesight zeroing"?

A. To align the fire control system (sights) with the rifle barrel, allowing a round to strike

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the point of aim of a target 300 meters down range (M16A2) or 250 meters down range (M16A1).

Q. What is the underlying concept behind battlesight zero (i.e., Why 300 meters?)?

A. Battlesight zero is the sight setting for a weapon that provides the highest hit probability for most combat targets with minimum adjustment to the aiming point. This has been determined by field testing to be at a range of 300 meters for the M16A2.

Q. What are the parts of the “fire control system” on the M16A2?

A.

- Front sight
- Rear sight apertures (2)
- Rear windage knob
- Elevation knob

Q. What is the larger aperture, marked 0-2, on the M16A2 used for?

A. For engaging moving targets and for engaging targets in limited visibility.

Q. What is the unmarked aperture used for?

A. Normal firing situations, zeroing, and with the elevation knob for target distances up to 800 meters.

Q. What is the proper procedure for firing the M16 while wearing the protective mask?

A. The weapon should be rotated (canted) only as far as necessary to properly see through and line up the sights. The center tip of the front sight post should remain on the ideal aiming point.

Q. List some training aids/devices used to sustain/practice basic marksmanship skills.

A.

- M15A1 Aiming Card
- Riddle Sighting Device
- M16 Sighting Device
- Target-Box Exercise
- Ball-and-Dummy Exercise
- Dime (Washer) Exercise
- Weaponeer
- MACS

Q. What does “MACS” stand for?

A. Multipurpose Arcade Combat Simulator.

Q. Explain the “Elevation and Windage Rule”.

A. The elevation and windage rule states that one click of elevation or windage moves the strike of the bullet a specific distance at a specific range. At a range of 25 meters, one click of windage moves the strike of the bullet .33 cm (right or left), and one click of elevation on the front sight moves the strike of the bullet .83 cm (up or down). NOTE:

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This rule applies to the M16A2 only.

Q. Each “click” of elevation on the elevation knob changes the point of impact how much at 100 meters?

A. 1.1 inch (3.3 inches at 300 meters, etc).

Q. Explain how to place the initial sight setting on the M16A2 rifle for 25 meters.

A. Adjust the front sight post up or down until the base of the sight post is flush with the sight post well. Turn the rear windage knob until the index mark on the 0-2 sight is aligned with the rear sight base index. Turn the elevation knob all the way down and then up, one click past the 8/3 mark ( $8/3 + 1$ ).

Q. Which sight aperture is used for zeroing?

A. The small sight aperture.

Q. Why must the elevation knob be set to ( $8/3 + 1$ ) on an M16A2 when zeroing on a 25-meter range?

A. The objective of battlesight zeroing is to adjust the sights in such a way that a round fired from the weapon will strike the point of aim of a target 300 meters down range. When a round is fired from a weapon that is battlesight zeroed it will strike a 25-meter target slightly below line of sight, crossing line of sight at about 50 meters, continuing to a maximum height at about 200 meters and then dropping again through the line of sight (point of aim) at 300 meters. Since you are not actually shooting at a target 300 meters away (only simulated due to a reduction in size) you must compensate by making an adjustment of one click “up”. Recall that each “click” in elevation on the elevation knob raises the strike of the round 1.1 inch at 100 meters (or approx.  $3/8$  inch at 25 meters). Therefore, this adjustment will cause you to strike your point of aim at 25 meters.

Q. After zeroing on a 25-meter target you move on to a Known Distance (KD) Qualification Range. You will be firing at targets out to 300 meters. What adjustments, if any, do you need to make to your M16A2?

A. Move the elevation knob back to 8/3.

Q. If you must zero on a field fire range with 300-meter feedback targets, what should the elevation knob be set to?

A. 8/3 (since you are actually firing at a target 300 meters away, the one click of adjustment is not necessary).

Q. What does the “8/3” stand for, anyway?

A. The “3” in 8/3 represents 300 meters when the elevation knob is turned all the way down. If you turn the elevation knob all the way up (back to 8/3), the “8” represents 800 meters (Sound familiar? Maximum effective range against area target).

Q. Your weapon is battlesight zeroed and you engage a target that you estimate to be 400 meters down range. The normal “instinct” is to aim high but if you know the M16A2

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like you should you will do what instead?

A. Adjust the elevation knob from “3” to “4” and aim center-mass.

Q. Explain how to set an M16A1 to mechanical zero.

A. Adjust the front sight post up or down until the base of the sight post is flush with the sight post well. Then adjust the front sight post 11 clicks in the “UP” direction (marked on weapon). This moves the post down into the well 11 clicks. Turn the rear windage drum until the rear sights are all the way to the left side. Then turn the windage drum back (right) 17 clicks so the rear sight is approximately centered.

Q. Which sight aperture is used for zeroing on an M16A1?

A. The “L” sight (“L”ong range).

Q. What are the standards for zeroing an M16A2 rifle?

A. Using 18 rounds or less, fire five out of six rounds in two consecutive shot groups within a 4-cm circle.

Q. An angle of fire that covers 4 cm at 25 meters covers \_\_\_\_\_ inches at 300 meters.

A. 19”

Q. When firing for qualification, what is an considered an “alibi”?

A. A malfunction of the rifle or ammunition, which is not associated with firer error.

Q. What are the qualification standards for a Record Fire (RF) range (pop-up targets)?

A.

- Expert                      36 - 40
- Sharpshooter            30 - 35
- Marksman                23 - 29
- Unqualified              22 - below

Q. What are the qualification standards for the Known Distance Alternate Course (KDAC) or the scaled 25-meter Alternate Course (AC)?

A.

- Expert                      38 - 40
- Sharpshooter            33 - 37
- Marksman                26 - 32
- Unqualified              25 - below

Q. What does “RETS” stand for and what is a “RETS Range”?

A. Remote Electronic Targeting System; a record fire range with electronically controlled, moving targets and/or pop-up targets.

Q. What firing positions and targets are used on a KD alternate course?

A.

- Prone supported position, 300 yards, E-type silhouette, 20 rounds, 60 seconds
- Prone unsupported, 200 yards, E-type silhouette, 10 rounds, 60 seconds



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- Prone unsupported, 100 yards, F-type silhouette, 10 rounds, 60 seconds

Q. What are “E-type” and “F-type” silhouettes?

A.

- E-type - full silhouette
- F-type - shoulder silhouette

Q. What firing positions and targets are used on a Record Fire (RF) range?

A. Two F-type silhouettes are placed at 50 meters with subsequent targets placed at 50 meter intervals out to 300 meters. Only E-type silhouettes are used beyond 100 meters. Targets are randomly raised, timed targets. 20 shots fired from the prone unsupported position and 20 shots from the supported fighting position (foxhole).

Q. What targets are represented on the scaled 25-meter alternate course?

A. 50- and 100-meter F-type silhouettes; 150-, 200-, 250-, and 300-meter E-type silhouettes. 10 targets total. 4 rounds in each target - 20 from prone supported position (120 seconds); 20 from prone unsupported position (120 seconds).

Q. When the M16A2 (w/magazine) is properly field stripped, how many parts are there (not including bi-pod)?

A. 14

Q. Are the M16A1 and M16A2 zeroing targets the same?

A. No, they are different.

Q. The M16A2 zero target is a network of squares superimposed on an E-type silhouette. Each “square” in the grid is 1-cm across. One click of adjustment on the front sight post will move the strike of the round \_\_\_\_\_ square(s) up or down on the zero target. Additionally, how many clicks of windage are required to move the strike of the round one square left or right on the zero target?

A. One; three.

Q. What does “LFX” stand for?

A. Live Fire Exercise

Q. The front sight post of the M16A1/A2 can be used to estimate range. In this way, the front sight post will be the same width as a man-size target when the target is located at a distance of \_\_\_\_\_ meters.

A. 175 (similarly, a man-size target will be half the width of the front sight post at 350 meters).

Q. Can .22-caliber rimfire ammunition be fired from the M16 rifle?

A. Yes, with the M261 Rimfire Adapter (RFA).

Q. What caliber bore does the M16 have?

A. .223

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Q. What is an “LLLSS”?

A. Low-Light-Level Sight System

Q. What do the following acronyms stand for: BRM, ARM, MILES, MOUT, POI, PPA, KD, AC, PRI, TASC, PMI.

A.

- BRM - Basic Rifle Marksmanship
- ARM - Advanced Rifle Marksmanship
- MILES - Multiple Integrated Laser Engagement System
- MOUT - Military Operations on Urbanized Terrain
- POI - Program Of Instruction
- PPA - Plastic Practice Ammunition
- KD - Known Distance
- AC - Alternate Course
- PRI - Preliminary Rifle Instruction
- TASC - Training and Audiovisual Support Center
- PMI - Preliminary Marksmanship Instruction

Q. What is a “chamber plug”?

A. A range safety device that is a small plastic plug designed to fit into the chamber of the M16. A handle extends out the ejection port so safety personnel can see at a glance that the rifle is cleared of ammunition.

Q. What is a “cookoff”?

A. A round that fires as a result of a hot chamber without the trigger being pulled. It can occur at any time until the weapon has cooled.

NOTE: Firing 140 rounds (4½, 30-round magazines), rapidly and continuously from the M16A1, will raise the temperature of the barrel to the COOKOFF POINT. At this temperature, any live round remaining in the chamber for any reason may cook off (detonate) in as short a period as 10 seconds.

Q. What is “cross dominance”?

A. A soldier with a dominant hand and a dominant eye that are not the same; for example, a right-handed firer with a dominant left eye.

Q. Will the M16 fire without the cam pin installed in the bolt group?

A. Yes, but it will explode.

Q. How much chamber pressure is generated with the firing of each round in the M16A2?

A. 52,000 psi

Q. Proper maintenance of the M16A2 rifle includes what five steps?

A.

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- (1) Clear
- (2) Disassemble
- (3) Inspect
- (4) Clean & lubricate
- (5) Assemble

Q. What does "CLP" stand for and how does it work?

A. Cleaner, Lubricant, and Preservative;

- it contains solvents to dissolve firing residue and carbon,
- it lays down a layer of Teflon as it dries to provide lubrication,
- it prevents rust from forming.

Q. What does "LAW" stand for and when is it used?

A. Lubricating oil, Arctic Weapons; at temperatures below 0 degrees F.

Q. Explain the proper procedure for performing a function check on an M16A2 rifle.

A.

- (1) Place the selector lever on SAFE. If the selector lever will not go on SAFE, pull the charging handle to the rear and release. Place the selector lever on SAFE. Pull the trigger to the rear. The hammer should not fall.
- (2) Place the selector lever on SEMI. Pull the trigger to the rear and hold. The hammer should fall. While holding the trigger to the rear, pull the charging handle to the rear and release. Release the trigger and pull it to the rear again. The hammer should fall.
- (3) Place the selector lever on BURST. Pull the charging handle to the rear and release. Pull the trigger to the rear and hold. The hammer should fall. While holding the trigger to the rear, pull the charging handle to the rear three times and release. Release the trigger and pull it to the rear again. The hammer should fall.

Q. Tracer ammunition is used to help hit targets during hours of darkness or low light levels. When using tracers, what is the recommended method of mixing with ball ammunition?

A.

- Top three tracer: to help you get on target.
- Every 5th or 6th round tracer: to help you stay on target.
- Bottom four tracer: to let you know when to change magazines.

NOTE: Tracer ammunition is not as effective as regular ball ammunition against most targets.

Q. When inspecting ammunition, what deficiencies should you look for?

A.

- Seriously corroded ammunition.
- Dented cartridges.
- Cartridges with loose bullets.
- Cartridges with the bullet pushed in (short rounds).

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Q. The first consideration when handling any weapon is to do what?

A. **CLEAR IT!**

Q. Blank ammunition should not be fired toward personnel within \_\_\_\_\_ feet or less from the muzzle, because fragments from a closure wad or particles of unburned propellant might inflict injury within that range.

A. 20

Q. What is the purpose of the “flash suppressor” on the M16/M16A1 model rifles?

A. Reduces the amount of flash from the muzzle when the weapon is fired.

Q. What is contained in the front sight post on weapons equipped with LLLSS?

A. A small glass vial of radioactive Tritium H 3.